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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Blakely Sokoloff Taylor & Zafman LLP
12400 Wilshire Boulevard
7th Floor
Los Angeles, CA 90025

EXAMINER

DOVE, TRACY MAE

ART UNIT

PAPER NUMBER

1745

14

DATE-MAILED: 08/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/494,211

Applicant(s)
Woo

Examiner
Tracy Dove

Art Unit
1745



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jun 17, 2002
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-28 and 31 is/are allowed.
- 6) ☒ Claim(s) 1-5, 19, 20, 29, and 30 is/are rejected.
- 7) ☒ Claim(s) 6-18 and 21-25 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

Art Unit: 1745

DETAILED ACTION

This Office Action is in response to the communication filed on 6/17/02. Applicant's arguments have been considered, but are moot in view of the new grounds of rejection.

Continued Prosecution Application

The request filed on 6/17/02 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 2 has been amended to recite "an amount of boron is 0.0005 to 0.5 wt% of copper", which is not supported by the specification as filed. Specifically, the specification does not support an endpoint of "0.5% wt%".

Note the previous 35 U.S.C. 112, first paragraph, rejection of claim 2 regarding scope of enablement has been withdrawn.

Art Unit: 1745

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5, 19-20, 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada et al., US 5,589,299.

Yamada teaches a negative carbon electrode for a nonaqueous battery comprising a collector with carbon formed thereon (abstract). The battery includes a positive electrode with a lithium transition metal oxide active material (col. 6, lines 56-67), an electrolyte (col. 7, lines 44-67) and a separator (col. 8, lines 10-27). The collector may be formed by a plating process (col. 5, lines 1-18). The thickness of the collector is in the range 0.1-500 μm (col. 5, lines 27-33).

Yamada teaches that the collector may comprise an alloy of iron-nickel-cobalt plated with copper or an alloy of nickel-copper plated with silver. See col. 3, lines 52-col. 4, lines 25.

Thus the claims are anticipated.

Art Unit: 1745

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1, 4, 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al., US 5,686,203.

Idota teaches a nonaqueous lithium battery having a positive electrode active material of a lithium transition-metal oxide (col. 6, lines 23-33), a negative active material of a carbonaceous material (col. 9, lines 45-57), a separator (col. 15, lines 57-61) and an electrolyte (col. 14, lines 17-55). The battery further comprises a positive electrode current collector and a negative electrode current collector. Examples of materials for the negative current collector include stainless steel (Fe-Cr containing), nickel, copper, titanium, aluminum, carbon, silver and cadmium with copper and copper alloys being particularly preferred. The thickness of the collector generally ranges from 1-500 μm . See col. 16, lines 12-33.

Idota does not teach any specific examples of the disclosed copper alloy.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Idota teaches and suggests that copper alloys are particularly preferred. One of skill would have known that a copper-silver containing

Art Unit: 1745

alloy or a copper-stainless steel (Fe-Cr) containing alloy for a negative electrode current collector would have been obvious in view of the teachings of Idota. Idota teaches materials used in negative current collectors and teaches that copper alloys are particularly preferred.

Regarding the process limitation "produced by a plating process", the courts have ruled that in the absence of unexpected results, product-by-process limitations are obvious. In re Fessman.

Claims 1, 4 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamahira et al., US 5,601,950, as evidenced by Idota et al., US 5,686,203..

Yamahira teaches a nonaqueous secondary battery having a positive electrode active material of a lithium transition metal oxide (col. 4, lines 1-7) and a negative electrode material of a carbonaceous material. The negative electrode may include a current collector. Preferably, the current collector comprises copper, nickel, cobalt, iron, chromium, molybdenum, tantalum, tungsten, stainless steel, titanium and mixtures thereof. More preferably, the current collector comprises copper, nickel, stainless steel, iron or alloys thereof. See col. 3, lines 25-43. Figure 1 shows a separator 3 and an electrolyte solution is taught in col. 4, lines 15-29.

Yamahira does not explicitly state any particular alloys for the current collector.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because Yamahira teaches it is preferred to have an alloy material comprises at least two materials selected from the group consisting of copper, nickel,

Art Unit: 1745

stainless steel and iron. Note stainless steel is an alloy of iron containing a high percentage of chromium (see Hawley's Condensed Chemical Dictionary, pages 1092-1093). Thus, one of skill would be motivated to choose copper and stainless steel as the alloy materials of the current collector because both materials are preferred materials and have melting points higher than 1000°C (note Table 1 of Yamahira). Yamahira teaches and suggests a current collector comprising an alloy of copper and stainless steel (iron-chromium).

Regarding the thickness limitation of the negative current collector, Yamahira teaches that the current collector occupies a small area and is preferably in the form of a foil, mesh, expanded metal or punched metal. Thus, Yamahira suggests that the foil has a thickness less than 20 microns because the reference teaches the current collector occupies a small area. Idota teaches that the thickness of the collector generally ranges from 1-500 µm. See col. 16, lines 12-33.

Regarding the process limitation “produced by a plating process”, the courts have ruled that in the absence of unexpected results, product-by-process limitations are obvious. In re Fessman.

Allowable Subject Matter

Claims 26-28 and 31 are allowed.

Claims 6-18 and 21-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 1745

The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach a lithium battery having a negative current collector of a Cu-based alloy of the instant claims. Specifically, the prior art does not explicitly teach a Cu-based alloy including at least four of the possible alloy constituents listed in the subject claims. There is no motivation in the prior art to pick the at least four alloy components of the instant claims.

Similarly, there is no motivation to pick the recited two (claims 7, 22 and 26) or three components (claims 8 and 23) of the Cu-based alloys of the instant claims.

Response to Arguments

Applicant's arguments with respect to claims 1-3 have been considered but are moot in view of the new ground(s) of rejection.

The 35 U.S.C. 102(e) rejection of claims 1 and 3 in view of Idota ('427) has been withdrawn. Idota is not prior art against the present invention.

The 35 U.S.C. 103(a) rejection of claim 1-3 in view of Kawakami and Idota has been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan,

Art Unit: 1745

who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

August 23, 2002


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700